

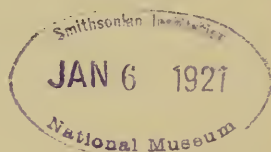
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NEW HEMIPTEROUS INSECTS OF THE GENERA
ARADUS, PHYTOCORIS AND CAMPTOBROCHYS

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1. *Aradus apicalis*, new species

Allied to *duzei* Bergr.; blackish fuscous, a mark on the expanded base of the elytra partially covering the base of the mesocorium, the apex of the scutellum, and the incisures of the connexivum pale or yellowish; antennæ stout, black. Length 7 mm.

Female: Head as long as the width across the eyes; vertex with the longitudinal depression broad, armed with a prominent tubercle anterior to the eye. Antennæ stout, scarcely shorter than the head and pronotum together; first segment obtuse-conical, scarcely longer than the apical thickness of II, dull castaneous at base; II and III cylindrical, as thick as the cephalic protuberance, II somewhat narrower at base; III three fifths the length of II; IV oblong, two thirds the length of III, its tip conical and clothed with pale hairs as in allied species. Rostrum pale, attaining the basal third of mesosternum. Pronotum a little shorter than the head, its width somewhat more than twice its length; greatest width at basal one third, sides less expanded than in *duzei*, latero-anterior margins nearly straight, coarsely and closely crenulated as in *duzei*, discal carinæ as in *duzei*, the median pair percurrent and but very little divergent posteriorly. Scutellum longer and narrower than in any allied species, one third longer than its basal width, the sides of the depressed apical portion rectilinear, apex obtuse. Elytra narrower than in *duzei*, membrane touched with pale along basal margin, obscurely dotted. Legs, including

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coxal cavities yellowish testaceous, the middle of the femora and tibiæ broadly brown; disk of the ventral segments and marginal incisures obscurely paler. Fifth ventral segment a little longer at median line than at sides, the hind margin straight across the middle; sixth segment as long as fifth and twice longer than the first genital segment which in turn is twice longer than the second; the apical lobes transverse, very feebly sinuated at apex.

Described from one female taken by me at the northern end of Fallen Leaf Lake, Eldorado Co., Cal., June 25, 1915. This species, while most closely related to *duzei* much resembles *behrensi* but the antennæ are longer, the scutellum longer and narrower, the pronotum broadest behind the middle with the median pair of carinæ nearly parallel, the rostrum longer and the humeral expansions and apex of the scutellum conspicuously yellowish. *Aradus fuscomaculatus* Stål has about the same form of scutellum but it has the antennæ a little shorter, the pronotum broadest at the middle and marked with pale, the elytra and abdomen more strongly maculated and the apical plates of the female more oblique.

Holotype, female (No. 679) in collection of the California Academy of Sciences.

2. *Aradus pannosus*, new species

Very near *fuscomaculatus* Stål, the antennæ shorter and thicker with the apex of the second segment whitish, the valves of the second female genital segment longer and subacute at apex and the genital lobes of the female narrower and more angled when viewed from below. Length $6\frac{1}{2}$ mm.

Female: Head a little longer than broad; antenniferous tubercles obtuse, scarcely attaining the tip of the first antennal segment. Antennæ a little shorter than basal width of pronotum; stout; second segment tapering to base, as long as III and IV together; III thickest, hardly one fourth longer than wide; IV shorter and narrower than III, oval, conical at tip which is not conspicuously cinereous. Rostrum attaining basal one fourth of mesosternum. Pronotum a little over twice wider than long, the expanded sides more rounded than in *fuscomaculatus*, with five or six larger teeth anterior to the widest point; carinæ prominent, the median pair outwardly arcuate on posterior lobe. Scutellum about one fifth longer than wide; sides straight and strongly elevated. Elytra a little shorter than in the allied species. Valves of second genital segment longer and more pointed than in *fuscomaculatus* where they are distinctly rounded at apex; the genital lobes viewed from beneath narrower and more angled at apex.

Color blackish fuscous; posterior edge of humeral lobes, extreme tip of scutellum, apex of second antennal segment and annulations of femora and tibiæ whitish; abdomen variegated with dull reddish fulvous, about

as in *fuscocomaculatus*; elytra largely whitish, their extreme base and the meso and exocorium beyond their basal third heavily marked with fuscous, the membranal nervures and their margins conspicuously white; the white apical portion of the second antennal segment nearly equal to the width of the cephalic protuberance.

Described from one female taken by me at Berkeley, Cal., February 2, 1915. While very near *fuscocomaculatus* this form seems to be sufficiently distinct by the characters of the antennæ and second genital segment. *A. fuscocomaculatus* is not uncommon under bark of rotting live oaks about the bay region and I have specimens taken by Rev. G. W. Taylor on Vancouver Island that do not seem to differ specifically.

Holotype (No. 680) in collection of the California Academy of Sciences.

3. *Aradus blaisdelli*, new species

Closely allied to *inornatus* Uhler but with the body much narrowed posteriorly as in *debilis* and *inornatus*, the rostrum shorter, antennæ stouter, sides of pronotum more narrowed anteriorly and the elytra distinctly varied with cinereous, the membrane especially being conspicuously veined with pale. Length 9–11 mm.

Head about as in *inornatus*; antennæ similar, scarcely shorter than the head and pronotum together, blackish fuscous, the second segment shorter and a little thicker at base, as long as the head from tip to hind margin of eyes; III and IV subequal, each nearly twice the length of I and a little thinner than apex of II; apex of IV conical and clothed with the usual grey pubescence. Pronotum twice as wide as long, widest just behind the middle, the broadly expanded sides obliquely narrowed anteriorly, not broadly rounded as in *inornatus*; margin irregularly denticulate, about three teeth anteriorly much larger; carinæ thicker than in *inornatus*, the median more distinct across the anterior lobe; tubercles of callosities more prominent, conical. Scutellum more depressed posteriorly with its margins strongly reflexed. Elytra reaching on to the sixth segment in the female, to the genital lobes in the male; humeral expansion broad as in *inornatus*. Rostrum passing the middle of the mesosternum, but little exceeding its base in *inornatus*. Genital lobes of male transverse, moderately oblique, of equal length across their whole width; fifth and sixth ventral segments in the female truncate at apex, sixth one fifth shorter than fifth; apex of first genital segment truncate, straight across its whole margin, in *inornatus*, a little oblique and feebly notched at center; second segment half the length of first; genital lobes dorsally triangularly ovate with their hind margin feebly arcuated, their inner margins separated, the ultimate dorsal segment nearly one-half as long as wide, its basal margin regularly rounded, its apical subangularly rounded; in *inornatus* this segment is much broader proportionately with the hind edge but little produced, distinctly transversely wrinkled in common with the inner ends of the genital lobes.

Color blackish fuscous; apex of first antennal segment and base of III indistinctly paler, as is also the edge of the bucculae, lower surface of antenniferous tubercles and tip of first segment of rostrum; expanded sides of pronotum pale; elytral venation mostly pale, the membrane with a whitish spot at base, the veins pale and margined with whitish; disk of connexival segments varied with pale rufo-fulvous, their hind margins more conspicuously pale; the venter quite largely varied with dull rufo-fulvous; tips of the tibiae pale. At least a portion of the granulations are pale, including a few on the legs and antennae.

Described from 10 male and 14 female examples taken at Huntington Lake, Fresno Co., Cal., July 7 to 22, 1919, at an altitude of 7-8,000 feet. These were all taken under loose bark of old stumps and logs of lodge-pole pine. It affords me pleasure to name this interesting addition to our fauna for Dr. F. E. Blaisdell of San Francisco, well known for his work on the Eleodini and other groups of the Coleoptera, as a token of friendship and in recognition of his enthusiasm in the pursuit of his favorite study and of his kind and prompt response to all appeals for assistance in the increase and improvement of the Academy's collection of insects. This species pertains to the group embracing *debilis*, *hubbardi* and *inoratus*; the thicker antennae will distinguish it from the former two and the more oblique latero-anterior margins of the pronotum and variegated membrane from the latter.

Holotype, male (No. 681) and allotype, female (No. 682) and paratypes in collection of the California Academy of Sciences.

4. *Aradus vadosus*, new species

Closely allied to *debilis* Uhler but with unicolorous antennae, shorter rostrum and more oblique pronotal margins. Length 10 mm.

Female: Head little longer than broad across the eyes, the apical process twice longer than its greatest width; spines of the antenniferous process terete, subacute, attaining the apical one fourth of the first segment, its base armed with a distinct tubercle; preocular tubercle large; middle of vertex with a double row of coarse tubercles, these rows diverging at apex; lateral depressions deep, narrow, parallel. Antennae almost as long as the head and pronotum together; segment II distinctly longer than median line of pronotum, slender, but slightly clavate at apex; III and IV subequal, the latter thickest of all, widened to base of the conical apex; all segments finely granulate without distinct apical teeth. Rostrum attaining apical third of mesosternum, the basal segment much shorter than the head. Pronotum two and a third times as wide as its median length; finely granulate, the sides broadly expanded and upturned, coarsely and irregularly crenate; the latero-anterior margins rectilinear

to the truncate anterior angles; widest point just behind the middle; carinæ moderately prominent, distant, nearly parallel, terminating anteriorly in a pale tubercle; callosities with a prominent tubercle; humeral lobes subangulate, the posterior evenly rounded and smooth. Scutellum one-third longer than broad, nearly flat, the sides gently arcuated to the rounded apex, the basal field but slightly elevated, feebly tricarinate. Elytra reaching on to the third tergal segment; costa moderately expanded at base; femora with a few small white tubercles. Genital plates broad and short, the basal about one-third the length of the sixth ventral segment, fully three times the length of the apical; genital lobes short, transverse, their greatest length hardly one third their width, their oblique apex arcuated.

Color testaceous varied with brown and tinged with rufous on the abdomen, scutellum and disk of the pronotum; antennæ becoming fuscous toward the apex with the extreme tips of segments II and III pale; elytral veins pale on a darker ground; tergum with a fuscous cloud on each segment at the connexival suture, the disk of segment six and the genital segment fuscous; rostrum fuscous, paler at base.

Described from one female taken on Vancouver Island, September 6, 1899, by Rev. G. W. Taylor. This specimen is paler than any allied form known to me.

Holotype in collection of the author.

5. *Aradus taylori*, new species

Allied to *acutus* Say but with more slender antennæ and the body less maculated; blackish fuscous, narrow hind margin of humeri and some marks on the elytra pallid; basal lunule of the head and incisures of abdomen pink; sides of pronotum strongly toothed. Length, male $7\frac{1}{2}$ mm., female 9 mm.

Male: Head a very little longer than broad across the eyes; antenniferous spines long, acute, reaching nearly to the apex of first antennal segment; preocular tubercle small, the postocular large, obtuse; anterior process as long as the width between the eyes; the lateral impressed vittæ moderately deep, finely granulate like the rest of the surface. Antennæ as long as head and pronotum together, more slender than in *acutus*; second segment one fifth longer than III and IV together, a little thickened at apex; IV three fourths of III, its tip conical and clothed with the usual grey pubescence. Rostrum pale, attaining hind margin of prosternum. Pronotum more than twice wider than long, widest just behind the middle; humeral angles broadly rounded; latero-anterior margin nearly straight, finely crenulate as are the humeri, and in addition armed with about four stout irregular teeth; surface nearly flat, the longitudinal carinæ feeble, the median pair diverging a little posteriorly. Scutellum flat, edges nearly rectilinear to the obtuse apex, but feebly elevated. Elytra narrow, attaining the genital segment, the humeral expansion narrow. Genital lobes oblique at apex with their angles rounded.

Color blackish fuscous; extreme base of vertex and incisures of connexivum above and below pinkish; venter dark castaneous; narrow hind edge of humeral lobes, a mark on the basal expansion of the corium and

the transverse veins on the latter pale; membrane with the narrow margins of the veins and a spot at base pale. Legs brown, paler beneath.

Genital lobes of the female a little longer than in *compressus*, distant, with their inner angles more acute.

Described from one male taken by the late Rev. G. W. Taylor on Vancouver Island from under bark, March 4, 1898. A female taken at the same time is notable in having the left elytron much abbreviated, the corium not attaining the apex of the scutellum and the rounded membrane reaching only to the second tergal incisure, the left wing complete, almost reaching the apex of the right elytron. This species has the flat surface and pale humeral margins found in *compressus* but the pronotal margin is shorter and strongly denticulate, the antennæ are more slender and the colors are different.

Holotype, male (No. 683) in collection of the California Academy of Sciences; allotype, female, in collection of the author.

6. *Aradus parshleyi*, new species

Allied to *compressus* Heid. but with the antennæ thinner at base, the latero-anterior margin of pronotum minutely granulate and strongly sinuated and the elytra more strongly marked; antennæ basally and legs brown; hind margin of humeral lobes and markings on the corium pale. Length 8 mm.

Female: Head a little longer than wide across the eyes; antenniferous tubercles short, reaching to middle of first segment; preocular and postocular tubercles small, obtuse; lateral impressed areas smooth anterior to the line of the hind margin of the eyes; base with a slender oblique whitish line. Antennæ as long as head and pronotum together; segment II as long as III and IV together, regularly thickened to its apex where it is as wide as III; the latter cylindrical and as thick as the anterior femora; IV scarcely shorter than III and but little thinner, about twice as long as I. Rostrum attaining basal one fourth of mesosternum. Pronotum a little wider than its median length, depressed as in *compressus*; sides broadly expanded and rounded almost to the anterior angles which are right-angled, thus forming a deep sinus; minutely crenulate or granulated, the crenulations stronger in the anterior sinus; carinate lines moderately elevated, the median pair about parallel. Scutellum longer than the pronotum, its basal width two thirds its length; its surface nearly flat, the sides moderately sinuated before the rounded apex and well elevated. Elytra subparallel, its basal margin somewhat expanded; membrane reaching the genital segment with a number of supernumerary cross-veins. Genital lobes obliquely rounded and well separated; sixth ventral segment a fourth longer than the truncate fifth segment and emarginate at apex; basal genital plate tumid, nearly four times as long as the short apical plates.

Color fuscous brown, paler on the humeral lobes, especially posteriorly, and on the elytra; the latter varied with fuscous at base and in the areoles; membrane fuscous with the brown veins bordered with whitish. First segment of antennæ and basal two thirds of second ferruginous; rostrum legs and venter more or less rufo-ferruginous; incisures of connexivum pale.

Described from one female taken by M. H. Ruhmann at Vernon, B. C., April 28, 1915, and kindly sent to me for study by Dr. H. M. Parshley to whom this species is dedicated in appreciation of the valuable and painstaking work he is doing on our North American Hemiptera. This species belongs to the group having the pronotum depressed and minutely crenulate or granulated on the lateral margins and including *compressus* Heid., *tuberculifer* Kirby and *funestus* Bergr.

Holotype in the Canadian National Museum at Ottawa.

7. *Aradus orbiculus*, new species

Apparently allied to *heidemanni* Bergr., but with a longer rostrum and nearly circular abdomen in the female. Length: male 8 mm.; female 12 mm.; width of abdomen, male 3 mm., female 6 mm.

Male: Body oblong, a little wider posteriorly, broadest at fifth abdominal segment. Head a third longer than wide across the eyes, much longer than median length of pronotum, the anterior process forming one half its length; impressed mark either side the vertex granulated; antenniferous tubercles long, subacute, much divergent; preocular tubercle small; postocular obsolete. Antennæ almost as long as the head and pronotum on the median line, moderately stout; first segment short, hardly twice longer than wide; II longer than the head, one half longer than III and IV together, a little thickened apically; III cylindrical, nearly twice the length of the fusiform fourth segment. Bucculæ slightly angularly elevated; rostrum attaining hind margin of anterior coxæ; first segment not reaching base of head. Pronotum much narrowed anteriorly; sides straight; hind angles broadly rounded; width on anterior margin equal to length on median line, less than half the basal width; hind margin deeply excavated. Scutellum narrow, deeply excavated, the basal elevation scarcely indicated; its length equal to that of the head, and nearly twice its basal width; sides parallel on basal one half; apex obtuse. Elytra long and narrow, reaching on to the genital plates, the expanded basal portion just passing the scutellum; their combined width at apex of corium one third greater than their individual width at base; veins prominent, closely ramose on mesocorium; principal veins of the membrane very prominent, the ramose veins almost obsolete. Genital lobes long, subangled and oblique at apex, formed much as in *compressus* Heid.

Female much larger than male, with the abdomen as wide as long beyond tip of scutellum; elytra short, oblong but slightly exceeding the scutellum, with no indication of membrane; sixth ventral segment as long as the two genital segments together; second genital segment very short,

rounded or subangular; genital lobes short and broad, scarcely angled behind, their inner margins rounded, distant, much as in *compressus*.

Color uniformly blackish fuscous; legs, inner edge of the genital lobes and sometimes the hind edge of the ventral segments tinged with castaneous.

Described from two male and three female specimens taken by me under loose bark of a stump of lodge-pole pine at Huntington Lake, Fresno Co., Cal., July 17, 1919, at an elevation of 7,000 feet. In this species the pronotum has about the form found in *heidemanni* but without the marginal crenulations; the male elytra are narrowed much as in the female *heidemanni* but in a less degree, while the females are brachypterous. It has much in common with *compressus* near which it should, perhaps, be placed.

Holotype, male (No. 684), allotype, female (No. 685), and paratypes in collection of the California Academy of Sciences.

8. *Aradus evermanni*, new species

Near *gracilicornis* Stål; form narrow, subparallel; antennæ shorter; pronotum shorter, its sides paler and more deeply denticulate, humeral angles more rounded; scutellum broader; elytral areoles reticulate. Length $4\frac{1}{2}$ mm.

Female: Head as in *gracilicornis*. Antennæ slender, as long as the head and pronotum united; first segment but little longer than thick, cylindrical; II distinctly longer than III and IV together, its immediate apex thickened, but little narrower than I; III and IV subequal, about as long as the dorsal thickness of the cephalic process; III cylindrical, IV fusiform. Rostrum just attaining the anterior coxæ. Pronotum distinctly shorter than the head, its median length one half its basal width; sides broadly flattened, strongly crenulate, slightly sinuated anteriorly without a distinct apical tooth; humeri broadly rounded, (in *gracilicornis* the sides are nearly parallel behind the widest point); six discal carinæ about as in its ally except that the median pair diverge more posteriorly. Scutellum a little shorter and proportionately broader than in *gracilicornis*, nearly one fourth longer than the pronotum. Elytra as in the allied species, all the areoles white, crossed by irregular fuscous veins; membrane distinctly maculated. Apex of fifth ventral segment truncate across the middle, its median line distinctly longer than the sides, its disk without a transverse impressed line; sixth segment on its median line as long as the fifth, very slightly excavated at apex, its apical angles equalling the genital segment; first genital segment truncate at apex, about twice as long as the apical, the valves of the latter triangular; genital lobes narrow and strongly curved at apex, almost meeting beyond the genital segment, their apical margin truncate and a little oblique.

Color black; first three segments of antennæ, expanded margins of pronotum, elytral veins, except at base and apex, and the connexivum obscure brown; incisures of the connexivum broadly pale.

Described from one female taken by me in Golden Gate Park, San Francisco, September 16, 1917. While very close to *gracilicornis* this species may readily be distinguished by the diagnostic characters given above. *Aradus marginatus* Uhler differs in color of antennæ, etc. Named for Dr. Barton W. Evermann, director of this Academy, in recognition of his ready assistance and of his unfailing interest in the broader phases of entomological study.

Holotype, female (No. 686), in the collection of the California Academy of Sciences.

9. *Aradus snowi*, new species

Allied to *falleni* but narrower, parallel, with thick, white antennæ, which are black only at base and extreme tip. Length 4 mm., width $1\frac{1}{3}$ mm.

Male: Head as in *falleni*, the anterior process quite strongly constricted near the base; vertex almost entirely depressed with a small median raised area and a few minute granulations, the margin prominent and a little produced behind the eyes. Antennæ about as long as in *falleni* but much thicker; first segment scarcely exceeding the antenniferous tubercle and hardly longer than wide; II somewhat shorter than III and IV together, regularly increasing in thickness from base to middle, beyond cylindrical and equal in thickness to an eye; III almost as thick as II and two thirds its length, a little narrowed basally; IV cylindrical, a little thinner than III and two thirds its length. Rostrum attaining the anterior coxæ. Pronotum a fourth shorter than the head, its median line one half its greatest width; sides strongly expanded and upturned, sinuated behind the prominent rounded anterior angles; behind the middle very feebly arcuated; discal carinæ as in the allied species but quite obviously arcuated, the edge closely, minutely crenulate. Scutellum longer than in *falleni*, the carinate sides rectilinear almost from their base. Costal margin of corium rectilinear from base nearly to apex, the areoles subhyaline and crossed by irregular veinlets.

Color black becoming brown on the expanded pronotal margins and on most of the elytral veins; the elytral areoles and membrane whitish hyaline, the latter quite distinctly maculated; antennæ creamy white; first segment, basal half of second and apical half of fourth black.

Described from one male taken by the late Prof. F. H. Snow in the Santa Rita Mts., Arizona, in June, between five and eight thousand feet elevation. The parallel form and conspicuous black and white antennæ will readily distinguish this interesting species. This specimen is carded so the genital characters are mostly covered.

Holotype, male, in collection of the author.

10. *Phytocoris ingens*, new species

Large and broad, oblong, pale grey, quite evenly dotted with fuscous points, those along the costa larger. Length 8; width 3 mm.

Male: Head short, vertical, projecting below the eye for a space less than the width of the eye below the antennæ; eyes very large, below attaining the line of the bucculæ; vertex depressed, narrow, its least width about half that of the eye viewed from above; front flat; clypeus prominent, convex, projecting strongly above the plane of the front; cheeks tumidly convex. Antennæ slender; segment I nearly as long as from its base to hind margin of pronotum, a very little thickened basally; II more slender, as long as from base of scutellum to apex of clavus; III a little longer than commissural margin of clavus; IV (wanting in male) in female one half of II. Length of pronotum two fifths its basal width; hind margin broadly rounded; callosities distinguished by a deep suture. Scutellum as long as pronotum, its basal field well exposed; hind femora nearly seven times as long as wide, gradually tapering from basal third; hind tibia one half longer than its femur, its spines short, not longer than thickness of the segment. Sinistral notch of genital segment right-angled, the dorsal angle produced in a blunt tooth arising from an extension of the dorsal tergite and lying beneath the margin of the genital segment; sinistral clasper of medium size, curved at apex, with a prominent obtuse shoulder near its base; dextral clasper small, blunt at apex, lying along the ventral wall of the notch.

Color cinereous, tinged with fulvous on the head, callosities, basal lobe of scutellum and abdomen; propectus, sides of the venter basally, a broad vitta on the sides of the pronotum inferiorly and a narrow line below this, blackish, the genital segment with a fuscous cloud either side. Above minutely but quite regularly dotted with fuscous, these dots imperfectly segregated into larger spots along the veins and costal margin; apex of corium with a black point near the angle of the cuneus; membrane white, regularly dotted with fuscous points, the veins dull fulvous. Antennæ pale brownish; base of II and III broadly paler; I pale with about six fuscous marks exteriorly. Femora varied with fuscous on apical half; tibiae with about three imperfect fuscous annuli, usually but one distinct. Upper surface sparsely clothed with stiff black hairs intermixed with pale ones on head and pronotum and short white deciduous tomentum. Female with fuscous markings beneath less extended.

Described from two males and two females taken by Mr. Fordyce Grinnell at Pasadena, Calif.

Holotype, male (No. 687), and allotype, female (No. 688), in collection of the California Academy of Sciences. Paratypes in collection of the author.

11. *Phytocoris aurora*, new species

Allied to *palmeri* but with more cinereous elytra and different male genitalia. Length 7 mm.; width 2 mm.

Male: Head oblique, produced beyond the eye for a space equal to the greatest width of the eye; front little convex, clypeus moderately so.

Antennæ slender; segment I as long as head and pronotum together, linear with a few long weak bristles; II more than twice the length of I; III one fourth longer than I, IV as much shorter. Pronotum twice wider than long; scutellum unusually convex, longer than wide at base. Elytra nearly parallel; hind femora seven times as long as wide; a little narrowed on basal and apical one fourth; hind tibiæ very long, almost equal to elytra including the membrane; rostrum reaching third ventral segment. Sinistral notch of genital segment shallow, its dorsal angle produced in a short upright tooth; sinistral clasper, large, convex, in form of a broad triangle with its apical margin a little concave; lower angle curved and hidden beneath the apex of the segment, dorsal angle acute and incurved, attaining the dorsal angle of the segment.

Color whitish testaceous, tinged with yellow on head and pronotum; a cloud on the vertex, about seven arcs on the front and a transverse vitta across cheeks and clypeus ferruginous; sides of pronotum broadly, the narrow base and median line, deep black, leaving a squarish discal spot which includes a few ferruginous marks about the callosities and on the collum; hind edge slenderly white. Scutellum fuscous with the median line and sides marked with whitish. Elytra dusky testaceous, a little more clouded along the apical margin, the veins and costa with inconspicuous brown and white marks; membrane fuscous obscurely irrorate with pale; a spot at apex of cuneus and a discal arc whitish. Beneath mostly blackish fuscous with the coxæ white. Legs whitish, the femora rufous-brown irrorate with whitish; tibiæ varied with brown, the anterior triannulate. Basal segment of antennæ rufous-brown, dotted with white, two of the spots larger; II pale brown with a white basal annulus twice longer than the thickness of the segment, followed by a fuscous cloud; III and IV infuscated, the former white at base as in II. Surface clothed with black hairs and white tomentum.

Described from one male taken by me at Cayton, Shasta Co., Cal., July 19, 1918. The male genital clasper is so distinctive the species cannot be confounded with any other known species; the markings of the head and pronotum are about those found in *palmeri*.

Holotype, male (No. 689) in collection of the California Academy of Sciences.

12. *Phytocoris tenuis*, new species

Aspect somewhat of *canescens* Reut.; smaller and more slender, more yellowish in color and marked with a fuscous vitta following the claval suture; the male genitalia very distinctive. Length $6\frac{1}{2}$ mm.

Male: Head oblique, produced beyond the eye for a space equal to two-thirds the length of the eye; front and clypeus tumidly prominent, leaving a deep sinus at base of clypeus; cheeks tumidly raised, almost tuberculate; vertex nearly flat, a little wider than the eye viewed from above. Antennæ long; segment I as long as head and pronotum together, moderately clothed with long pale hairs and a few stiff bristles; II not quite twice the length of I; III and IV together shorter than II. Pronotum twice wider than long, with prominent humeri. Elytra parallel, twice longer to

apex of cuneus than together wide; hind femur six times longer than wide, subparallel to beyond the middle, then a little narrowed to apex; hind tibiae with weak bristles not longer than thickness of the segment; rostrum attaining third ventral segment. Sinistral notch of genital segment shallow; sinistral clasper linear, curved around the apex of the segment, at base giving off an erect dorsal branch as long as the horizontal member and rising to the dorsal line of the segment where it is bent abruptly backward, terminating in line with the apex of the genital segment; dextral clasper small, distorted in the type, apparently triangular.

Color yellowish testaceous, darker on head and pronotum; pronotum with a fuscous basal vitta before the slender white hind edge, carrying about six spots of tufted black hairs. From this dorsal vitta seven indistinct longitudinal rays run to the anterior lobe, the lateral two the most obvious. Scutellum with a pale median line more or less indicated and a fuscous spot either side before apex. Corium with an indefinite fuscous vitta following the claval suture and deflected along the apical margin to apex of cuneus, this vitta marked with a few pale spots bearing clusters of white hairs; membrane pale, quite thickly irrorate with fuscous; veins yellowish. Hind femora more or less distinctly marbled with fuscous; venter infuscated, the tip of the rostrum black. Apex of antennae infuscated, the base of III paler. Upper surface clothed with black hair in fresh specimens.

Described from one pair taken by me on Mt. Tamalpais, Marin Co., Cal., June 23, 1918, and a female taken by Dr. E. C. Van Dyke at same locality, September 19, 1909. This is the most slender *Phytocoris* known to me and seems to connect *canescens* with *lineatus* and *validus*; the rayed pronotum and the fuscous vitta on the elytra will distinguish females while the remarkable male genitalia will at once locate that sex.

Holotype, male (No. 690), allotype, female (No. 691), and paratype in collection of California Academy of Sciences.

13. *Phytocoris sonorensis*, new species

Aspect of *canescens* but larger and broader, the elytra and antennae more varied; sexes similar. Length 7 mm.

Male: Head vertical, produced below the eye for a space greater than the length of the eye; eyes small, but moderately produced inferiorly; front a little convex between the antennae. Antennae long; segment I a fourth longer than pronotum; a little thicker near the base; II twice as long as I; III a third shorter than II; IV one fourth shorter than I. Elytra together nearly as wide as their length to tip of clavus. Rostrum passing hind coxae. Hind femora nearly equal to length of elytra to tip of cuneus, slender, nine times longer than wide, widest near base then gradually a little narrowed to apex. Sinistral notch of genital segment rather small, right-angled, margin oblique dorsally and there carrying a large curved, suberect lenticular tooth arising from the produced angle of the apical tergite; sinistral clasper large and broad, its dorsal angle forming a blunt tooth, the apical portion abruptly slender and incurved; dextral clasper small, lying along the ventral wall of the notch.

Color obscure testaceous-grey clouded with fuscous; head black at apex with a transverse white vitta below the antennæ. Antennæ brown; segment I black dotted with white; II with a white annulus at base and an obscure one beyond the middle; III white at base. Pronotum fuscous, clothed with black hairs; hind margin white, preceded by six black spots bearing tufts of black hairs; scutellum with a double fuscous vitta, diverging posteriorly leaving a pale median line expanded at apex. Discal region of elytra fuscous; costa brown, becoming black at apex of corium, varied with pale dots; apex of corium with a polished angular pale spot; cuneus pale, mottled, becoming black at apex and on internal margin; membrane fuscous closely irrorate with pale; nervures fuscous, white at apex. Femora pale at base, fuscous and irrorate with pale at apex; tibiæ blackish with three broad white annuli. Beneath black, coxæ paler, rostrum rufous. Female paler and more clearly marked above than male.

Described from two males taken by me at Alpine, San Diego Co., Cal., June 7, 1913, and two females taken on the Cuyamaca Mts. at Descanso, Cal., at 5,000 feet elevation, October 5, 1913.

Holotype, male (No. 692), in collection of the California Academy of Sciences. Allotype, female, and paratypes in collection of the author.

14. *Phytocoris calvus*, new species

Form and aspect of *sonorensis* nearly, a little smaller and more reddish in color; head and anterior margin of pronotum pale yellowish; second antennal segment obscurely annulated; coxæ white; membrane irrorate; apex of corium with angular polished pale spot. Length 6 mm.

Male: Head short, nearly vertical, produced below the eye for a space equal to greatest width of eye; front full, clothed with long procumbent white hair; clypeus feebly arcuate; vertex flat, as wide as the eyes viewed from above. Antennæ slender; segment I but little shorter than basal width of pronotum; II three fourths longer than I; III one fourth longer than I, IV as much shorter; I armed with a cluster of long white hairs exteriorly near the base. Pronotum a little more than twice broader than long. Scutellum a little broader than long, its length subequal to that of the pronotum; upper surface clothed with short black hairs intermixed with flattened black hairs and white tomentum; tibial spines long and stout, rufous-brown. Sinistral notch of genital segment rectangular, armed with a large acute tooth above which is produced backward; sinistral clasper attaining tip of genital segment, at base with a dorsal obtusely angular tooth; dextral notch with a short acute tooth above, the clasper filling the ventral portion of the notch and attaining its apex.

Color rufous-brown, but slightly maculated; head and anterior portion of pronotum yellowish white; base of vertex with an angular pale fulvous vitta; clypeus with an angular mark and spot at base fulvous-brown, the cheeks still darker with a white suture, a spot at base of antennæ white edged with brown. Pronotum posteriorly castaneous brown with a sinuate black vitta before the white basal margin. Scutellum feebly varied with

paler. Elytra dusky on the disk, becoming rufous at tip of corium and anterior to the white angular spot at apex; cuneus rufous; membrane white, irrorate with fuscous, leaving two white marginal spots. Below rufous, the pleural pieces piceous; coxæ white; legs white, the femora marked with fuscous apically, the posterior more broadly so, with two white annuli; tibiæ faintly triannulate with fuscous. Antennæ pale brown; segment I white marked with rufous; II with base and a broad annulus beyond the middle white; III white at base.

Described from one male taken by Mr. Fordyce Grinnell on Mt. Wilson, Los Angeles Co., Cal., August 10, 1909. The uniform rufous color, pale head and coxæ, flattened black hairs above, and the cluster of white bristles on first antennal segment with the genital characters will sufficiently distinguish this species.

Holotype, male, in collection of the author.

15. *Phytocoris onustus*, new species

Allied to *eximius* Reut., a little larger and darker with darker antennæ and, like that species, belonging to the group with marmorate membrane; differing widely in male genitalia. Length 7 mm.

Male: Head a little longer and more oblique than in *eximius*, exceeding the eye for a space equal to the greatest width of the eye; vertex more flattened. Antennæ slender; segment I a little thickened basally, as long as from their insertion to the base of the pronotum; II thinner, more than twice the length of I and about equal to the costal margin of the corium; III and IV together equal to II; III longer than I, IV shorter. Pronotum as in *eximius*, its length three fifths its basal width, sides straight, humeri prominent. Scutellum equal to pronotum in length; rostrum passing hind coxæ; legs as in *eximius*. Male genital segment large, convex; sinistral notch right-angled, the dorsal angle obtuse, unarmed; sinistral clasper large, sickle-shaped, with a prominent dorsal tooth near its base; black with luteus apex; dextral clasper long as the sinistral, bent near the base and armed there with a dorsal tooth equal to its own width, at apex paler and curved inward and upward, subacute.

Color yellowish cinereous, much invaded with fuscous; head pale, the disk of the cheeks, apex of clypeus and about six arcs on the front fuscous; disk of pronotum pale, sides and base broadly blackish, the latter area broken at the middle; hind edge white; callosities marked with a double pale arc; scutellum pale with a blackish vitta either side the pale median line, these diverging posteriorly, basal angles with a fuscous spot. Elytra fuscous, obscurely irrorate with pale and each marked with three polished areas, one subbasal, one median and one apical invading the base of the fuscous cuneus. Membrane pale fuscous marmorate with whitish forming a pale spot at apex of cuneus and two obscure discal areas; nervures fuscous, the cubital thick and black. Antennæ fuscous; segment I irrorate with pale with a few black bristles near base; II with base narrowly pale; III with base and extreme tip pale. Legs irrorate with fuscous at apex, the hind femora becoming fuscous at apex with paler

band and irrorations; tibiae fuscous with about four pale annuli, tibial bristles pale, longer than thickness of the segment. Beneath mostly black with the coxæ pale.

Female somewhat paler than the male with disk of pectus and venter pale, the fuscous basal area of pronotum having about six black spots on the submargin.

Described from one pair taken by me at Salamanca, N. Y., July 20, 1911, and one female taken at Boston, Erie Co., N. Y., August 1, 1909.

Holotype, male (No. 693), and allotype, female (No. 694), in collection of the California Academy of Sciences; paratype in collection of the author.

16. *Phytocoris erectus*, new species

Aspect of *eximius*, differing principally in the very distinct male genitalia. Length 6 mm.

Characters of *eximius* nearly. Eyes a little more narrowed below. Colors more strongly contrasting, the elytral markings tending to form a vitta on the disk of the clavus and another on the corium next the claval suture; apex of corium with a conspicuous polished angular pale spot preceded by a triangular fuscous mark and bordered outwardly by the fuscous apex of the corium. Cuneus with fuscous irrorations segregated at apex, its inner margin with two black points. Membrane pale fuscous with a double subhyaline mark beyond the apex of the cuneus, one in the larger areole and a loop on the disk, with some irregular marks toward the base. Sides of the pectus and venter and the genital segment mostly black. Hind femora with moderately distinct pale subapical annulus; scutellum with a pair of fuscous points near apex. Genital segment of male short; sinistral notch right-angled, its dorsal angle prominent, forming a blunt tooth; sinistral clasper large, sickle-shaped, strongly curved, with its apex acute and reaching under the dextral clasper, its base with a long ligulate erect dorsal tooth attaining the dorsal angle of the segment, of nearly equal width throughout or a little enlarged at apex; dextral clasper very large, flattened and curved to conform with the figure of the segment, its subacute apex lying close to the base of the dorsal tooth of the sinistral clasper, its broad base produced in a subacute, vertical tooth.

Described from one male taken by me at Salamanca, N. Y., July 20, 1911, one male taken at Kearney, Ont., July 27, 1919, by my brother, M. C. Van Duzee, and two females taken by W. J. Palmer at Lake Temagami, Ont., August 12, 1906.

Holotype, male from Salamanca (No. 695), and allotype, female from Temagami (No. 696), in collection of California Academy of Sciences, paratypes in collection of the author.

17. *Phytocoris canadensis*, new species

Very close to *erectus* but with distinct genital characters and the pale ventral area more widened posteriorly, covering the entire last ventral segment; genital segment fuscous either side, the median line and apex pale. Length 6 mm.

Sinistral male clasper with its dorsal tooth hardly half as long as in *erectus*, triangular as viewed from before and acute at apex; dextral clasper shorter and more slender on apical portion, its dorsal tooth much larger, acute, nearly parallel with the ventral member than which it is one-half shorter.

Described from one male taken at Kearney, Ont., July 29, 1911, by my brother, M. C. Van Duzee. It is with some misgivings that I found a species on such slight genital characters, but the differences here are far greater than those that have been used in the discrimination of species by workers in other genera of the Hemiptera and it is quite probable that the study of a large series will justify the separation of this species. In using male genital characters in distinguishing species I much prefer to employ those of the claspers, which are essential organs in copulation, than those of the ædeagus which is chitinized to a less degree and therefore more subject to distortion. The claspers also are frequently observable externally without dissection of the specimen, which, with scant material, is inadvisable. As a final test in close cases it probably would be better to use both sets of organs when the material will allow.

In my comparative notes on these species I have used Mr. Heidemann's determination of *eximius* which I believe is correct. Reuter's determination of 1909 (Nark. Capsiden, p. 23) is plainly incorrect and refers to a species with irrorate membrane, apparently *inops* Uhler.

Holotype, male, in collection of the author.

18. *Phytocoris histriculus*, new species

Aspect of *minutulus* Reut., a little larger and paler with the elytra more variegated; first antennal segment armed with many erect long white bristles. Length $5\frac{1}{2}$ mm.

Male: Head rather long, oblique, produced before the eye for a space almost equal to the length of the eye; front rather prominent. Antennæ long; segment I as long as the basal width of the pronotum; II about twice the length of I; III and IV together longer than I, subequal. Basal

width of pronotum more than twice its length; scutellum equilateral. Elytra as in *sonorensis*, more parallel than in *minutulus*; hind tibiae about one half longer than their femora, the spines long and pale, rather distant. Sinistral notch of genital segment rounded, the dorsal angle retreating; sinistral clasper small and black, angled at base, its slender apex abruptly rufous; dextral clasper narrow, terete, attaining apex of the genital segment.

Color cinereous with a slight pinkish tint; anterior lobe of pronotum and venter rufous-brown, varied with darker, the collum with a white median point; front with six dark arcs, cheeks brown with two pale bands that cross the clypeus, the base of the latter with an angled dark mark; pronotum dark olive brown with a broken black band anterior to the white hind edge; scutellum marked with fuscous on the disk and with two dark points before the apex. Elytra whitish, much varied with fuscous, these marks tending to form two transverse bands; angular apical spot on corium indistinct; apical vein with a black point, the inner margin of cuneus varied with black and white beyond the pale base; membrane white blotched and irrorate with fuscous, the veins pale becoming black at end of the areoles. Legs white, the apex of the femora maculated with fuscous, the posterior showing two pale annuli. Beneath pale with the mesosternum and sides of the venter abruptly fuscous, the inferior sides of pronotum black, bisected by a white line. Antennae pale brown, the base of segments II and III white; I white, banded and dotted with fuscous and armed with many erect stiff white bristles that are considerably longer than the thickness of the segment; II showing a faint pale annulus beyond the middle. Female not as clearly marked as male but otherwise similar.

Described from two male and eight female examples taken by me at Sweetwater Valley, near Alpine, San Diego Co., Cal., June 18, 1913, and at La Jolla, Cal., July 14, 1914. This neat little species much resembles *plenus* but aside from sexual characters it may be distinguished by its smaller size, the more hispid first antennal segment, the fuscous border to the venter and especially by the equality of the last two antennal segments.

Holotype, male (No. 715), and allotype, female (No. 716), in collection of California Academy of Sciences; paratypes in collection of the author.

19. *Phytocoris carnosulus*, new species

Size and aspect of *minutulus* Reut., differing in the irrorate membrane and more varied maculation as well as the more pinkish tint. Length 5 mm.

Male: Head a little oblique, produced beyond the eye for a space equal to two thirds the length of the eye; front full; clypeus very prominent, regularly arcuated. Antennae rather short; segment I three fourths as long as basal width of pronotum, linear, with but few stiff hairs; II a little more than twice the length of I; III and IV together longer than II, III scarcely longer than IV. Pronotum twice as wide as long; scutellum one fourth wider than long, the basal lobe well exposed; elytral costa feebly yet distinctly arcuated; upper surface sparsely clothed with

short grey hairs interspersed with longer black ones, the fringe of long hairs, or lashes, on the collum conspicuous. Hind femora about seven times as long as wide, tapering from before the middle; hind tibiae with but few short erect spines. Sinistral notch of genital segment right-angled, with a large blunt tooth above forming the apex of the produced angle of the last tergite; sinistral clasper with a rounded angle dorsally about one third from base, the sinuate apex attaining the tip of the segment; dextral clasper ligulate, its rounded apex just passing the tip of the segment.

Color pale testaceous or whitish with a faint tinge of pink on the elytra; head and pronotum brownish fulvous the apex of the clypeus, disk of the cheeks, sides of pronotum above and below and the collum, except at middle, fuscous or black. Scutellum black or mostly so, with a pale apex and an orange spot either side on the basal lobe. Elytra irregularly mottled with fuscous forming a blackish cloud on base and apex of clavus and on basal third and inner angle of corium; apical angle of corium fuscous; angular pale apical spot scarcely indicated; costa white dotted with fuscous; cuneus pale with fuscous apex; membrane whitish, sparsely irrorate with pale brown, the areoles mostly brown, margin with two white spots beyond the cuneus, veins fuscous, pale at apex. Beneath mostly fuscous, the prosternum and coxae whitish. Legs whitish, the femora maculated toward their apex, the posterior showing a broad vitta before the apex, the tibiae with their base and three annuli fuscous. Antennae pale brown, the narrow base of segments II and III white; I white, maculated with brown forming about two broad bands. Female with the elytral markings more diffuse and the pale annulus on the hind femora scarcely distinguished.

Described from two male and two female examples taken at Prescott, Arizona, July 1, 1917, by Mr. C. A. Hill. The faint pinkish tinge is more pronounced in the male and may not persist long after the specimen has become dry.

Holotype, male (No. 697), and allotype, female (No. 698), and paratypes in collection of California Academy of Sciences.

20. *Phytocoris rusticus*, new species

Related to *inops* Uhler but darker and less maculated with the tibiae unicolorous. Length $6\frac{1}{4}$ mm.

Male: Head a little oblique, produced beyond the eye for a space but little less than the length of the eye; vertex flat; front moderately convex. Antennae as long as in *inops*; segment I a fourth longer than the pronotum, moderately stout, a very little thicker near the base, armed with a few erect bristles longer than the thickness of the segment; II almost twice the length of I; III about one half of II; IV as long as pronotum. Rostrum attaining apex of hind coxae. Pronotum twice wider than long; costal margin of elytra very feebly arcuated; hind femora lenticular, widest a little before the middle, about five times as long as wide; hind tibiae as long as elytra to tip of cuneus, with a double row of about 12 spines. Sinistral genital notch hardly right-angled, its dorsal angle rounded; sinistral clasper broad with a large blunt tooth dorsally, the attenuated apical member curved in conformity with the contour of the segment and terminating beneath the dextral clasper; the latter broad and flat, angled near its base, arcuated, and passing the truncated apex of the segment.

Color rufous-brown, moderately polished, the head a little darker; pronotum with an even black vitta before the slender pale hind margin; elytra with an obscurely paler area on the disk of corium and an angular one at apex; cuneus more rufous, blackish at tip and on inner edge; membrane fuscous, irregularly and confluentlly irrorate with pale, the veins rufous. Beneath paler on the coxæ and apex of genital segment. Legs concolorous with upper surface, obscurely irrorate with paler; tarsi paler on the middle; rostrum pale. Antennæ a little paler; segment I very obscurely dotted with pale; II very narrowly pale at base, the pale portion not longer than thickness of segment; III scarcely paler on immediate base. Upper surface clothed with short stiff black hairs and deciduous white tomentum.

Described from two males from Mt. St. Helena, Napa Co., Cal., June 9, 1918, four females from Colestin, Jackson Co., Oreg., August 1, 1918, one male from Cayton, Shasta Co., Cal., July 15, 1918, and one from Sisson, Cal., July 25, 1918, all taken by myself on pines, and one male from Yosemite, Cal., June, 1916, and one female from Tallac, Eldorado Co., Cal., August 22, 1916, both taken by Mr. W. M. Giffard. The almost uniform dark reddish brown color and the very narrow pale annulus at base of second antennal segment will distinguish this species.

Holotype, male (No. 699) from Mt. St. Helena, allotype, female (No. 700) from Cayton, and paratypes in collection of California Academy of Sciences.

21. *Phytocoris maritimus*, new species

Aspect of *rusticus*, smaller and more fuscous with the pale annulus at base of second antennal segment longer and followed by a darker band; hind margin of pronotum and front of hind femora blackish. Length nearly 6 mm.

Male: Head about as in *rusticus*, little oblique, produced before the eye for a space equal to two thirds the length of the eye. Antennæ rather short; segment I as long as from hind margin of pronotum to middle of the eye, moderately stout, scarcely thicker at base, clothed with appressed dark hairs and a few long slender bristles; II one half longer than basal width of pronotum; III very little longer than basal width of pronotum; IV as long as I. Pronotum twice longer than wide; elytral costa scarcely arcuated. Hind femora short, about as long as second antennal segment, nearly six times as long as wide, widest at basal third. Rostrum attaining third ventral segment; spines on hind tibiae much longer than thickness of the segment, distant. Genital segment long and narrow; sinistral notch shallow, its dorsal angle retreating; sinistral clasper small, black, convex, strongly obtusely angled dorsally near base, apex paler, obtuse, incurved; dextral clasper ligulate, apex rounded and armed above with an acute point; as long as the ventral wall of the notch.

Color brownish fuscous, paler on head and anterior lobe of pronotum; hind margin of pronotum with an even black vitta as in *rusticus*, the

exterior edge pale; elytra with a broad obscure transverse fuscous band at basal fourth covering most of the clavus; apex of corium with a fairly distinct angled pale polished spot preceded by a fuscous mark; costal margin varied with fuscous; cuneus pale with inner margin and apex blackish; membrane fuscous, sparsely and obscurely irrorate with pale and leaving a pale spot at apex of cuneus; veins pale at apex. Venter tinged with rufous and varied with fuscous; breast mostly black, the coxæ white; male genital segment infuscated; femora rufous-brown irregularly dotted with pale, paler at base, the posterior pair blackish anteriorly; anterior and intermediate tibiæ pale with about three fuscous annuli, the posterior dotted with fuscous. Antennæ pale brown becoming darker at apex; segment I fuscous obscurely dotted with pale; II with a basal white annulus three times as long as thickness of the segment, followed by a somewhat wider fuscous cloud. Upper surface with black hairs intermixed with white tomentum as in *rusticus*.

Described from two males and four females taken at Carmel, Cal., March 24, 1919. In this species and *rusticus* the irrorate aspect of the elytra is wanting, the pattern of marking being more as in *cunealis*.

Holotype, male (No. 701), and allotype, female (No. 702), and paratypes in collection of California Academy of Sciences.

22. *Phytocoris stellatus*, new species

Allied to *maritimus* with the size and aspect somewhat of *conspersipes* Reut., reddish or testaceous brown with scattering pale points bearing clusters of deciduous white hairs, body clothed with long black hairs in places; second antennal segment with narrow pale base. Length 6 mm.

Male: Head nearly vertical, produced beyond the eye for a space nearly equal to the width of the eye; vertex flat, about as wide as an eye; front scarcely convex; eyes large, prominent, round when viewed from above. Antennæ short; segment I scarcely longer than the pronotum, linear; II almost three times as long as I; III and IV together equal to II, III a little the longer. Pronotum more than twice wider than long; elytra almost parallel. Hind femora about six times longer than wide, widest at basal third; rostrum reaching apex of hind coxæ. Head, pronotum and elytra rather thickly clothed with decumbent stiff black hairs that are as long as the thickness of the hind tibiæ, those on head and anterior margin of pronotum longer, procumbent or nearly erect; segment I of antennæ with numerous erect stiff bristles longer than the thickness of the segment; gula and lower surface with a few pale hairs. Sinistral clasper nearly terete, slender, its base without the dorsal angle found in the allied species, its apex recurved and slender; dextral clasper slender, little flattened, just passing apex of genital segment.

Color rufous or testaceous-brown varied with pale; hind edge of pronotum white, preceded by six or eight black spots forming an interrupted band; vertex with a median pale yellow vitta; pronotum and elytra with scattering round white spots bearing clusters of silvery hairs, these sometimes segregated in a median and an apical spot, connected along the claval suture; membrane subhyaline with rufous veins and faint clouding,

especially about the apex. Legs pale rufous dotted with whitish, the posterior darker and clothed with long brown hairs; spines of hind tibiae long, pale. Antennae pale brown; segment I pale and dotted with fuscous; II becoming black at apex, its base with a white annulus not longer than thickness of the segment. Body beneath castaneous, the coxae whitish. Female a little broader and more rufous than male.

Described from one male and two females taken by me on pines at Carmel, Cal., March 24, 1919.

Holotype, male (No. 703), and allotype, female (No. 704), and paratype in collection of California Academy of Sciences.

23. *Phytocoris commissuralis*, new species

Size and form of *fenestratus* Reut., nearly; mottled ash-grey, base of second antennal segment clear white; commissural margin of clavus whitish, immaculate; membrane white, conspicuously dotted with blackish. Length 8 mm.

Male: Head nearly vertical, much produced, length below the eye equal to length of eye; vertex flat, front slightly swollen. Antennae of medium length; segment I about as long as head and pronotum together when viewed vertically, a little thickened toward base, basally armed with stout bristles, mostly white and as long as the thickness of the segment; II fully twice the length of I; III nearly as long as basal width of pronotum; IV two thirds of I. Pronotum a little more than twice wider than long. Hind femora six times as long as wide, widest at basal one fourth; spines of hind tibiae as long as thickness of the segment. Rostrum passing middle of venter. Upper surface clothed with flattened deciduous black and white hairs, the collum and base of vertex with the usual long bristles or lashes. Sinistral genital notch shallow, rounded; sinistral clasper broad, angularly toothed dorsally near the base and again before apex of the ventral extension of the genital segment, its apex covered; dextral clasper rather long, curved, angled exteriorly above the base.

Color cinereous-grey much varied with fuscous. Head and anterior lobe of pronotum whitish with a few ferruginous marks; cheeks bilineate with black; posterior lobe of pronotum infuscated, forming a sinuated vitta or six black tufted spots before the white posterior margin; scutellum pale, the basal lobe black trilineate with fulvous, apex black with the median line and a short one either side whitish. Elytra varied with fuscous, especially at base and along the veins, the commissural margin of the clavus broadly pale; cuneus pale, its inner margin marked with black; membrane white, sprinkled with numerous vermiculate marks, the veins heavy, fuscous. Femora white varied with fuscous, the posterior with a white subapical vitta; tibiae triannulate with black, these confused on the hind pair; tarsi pale medially; beneath largely black, the coxae white. Female broader than male with the venter paler.

Described from two males and two females taken by me at Huntington Lake, Fresno Co., Cal., July 24, 1919, at an altitude of 7,000 feet.

Holotype, male (No. 705), allotype, female (No. 706), and paratypes in collection of California Academy of Sciences.

24. *Phytocoris sagax*, new species

Allied to *commissuralis*; head and pronotum anteriorly yellowish; pronotum margined and elytra maculated with fuscous; membrane irrorate. Length 7 mm.

Male: Head long, oblique, produced beyond the eye for a space equal to greatest width of the eye; front moderately convex; clypeus broad, prominent. Antennæ long; segment I as long as head and pronotum together when seen from above; II as long as costal margin of corium; III one half of II; IV a little longer than pronotum. Pronotum twice wider than long, somewhat polished; elytra nearly parallel; hind femora (female) six times as long as wide, its tibial spines long. Upper surface clothed with black decumbent hairs and flattened white tomentum; rostrum reaching middle of venter. Genital segment small; sinistral notch deep; sinistral clasper small with a dorsal angle some ways from the base; forming a blunt tubercle; tip of the clasper hidden beneath the apex of the segment; dextral clasper very long, broad and flattened at base, its truncate apex curved so as to almost meet the dorsal angle of the sinistral notch.

Color testaceous white; head and middle of anterior margin of pronotum more yellowish, varied with ferruginous; sides of pronotum anteriorly and inferiorly black, marked with a white point behind the eye; hind margin with an even black vitta before the white edge. Scutellum with a black point either side before the apex. Elytra fuscous, opaque; clavus, base of corium, a large spot on the middle extended along the costa to apex and an angular spot at apex of the corium polished whitish, inner edge of cuneus varied with black; membrane blackish, irrorate more or less with white, forming a white spot at apex of the areole. Beneath mostly pale with the pectoral pieces largely black, the coxæ white. Legs pale, the femora marmorated with fuscous at apex, on anterior pair interrupted by a pale longitudinal line on either side; tibial spines long, brown, on brown dots, the apex of the tarsi infuscated. Basal segment of antennæ black dotted with white; II fuscous at base and apex, brownish on the middle, base rather broadly white; III brown, white at base; IV brown. Female a little broader than the male and more clearly marked in the type.

Described from one pair taken by me at Sisson, Cal., July 24, 1918.

Holotype, male (No. 707), and allotype, female (No. 708), in collection of California Academy of Sciences.

25. *Phytocoris nigrifrons*, new species

Large, elongate-ovate; pale yellowish white; vertex with a large polished black spot; posterior vitta of pronotum and lineations on elytra black. Length $8\frac{1}{2}$ mm.

Female: Head oblique; produced beyond the eye for a space greater than the length of the eye; eyes seen from above ovate. Antennæ long; segment I as long as basal width of pronotum, slightly thickened to the base; II as long as costal margin of corium; III one fourth longer than I; IV a little longer than the pronotum; Pronotum less narrowed anteriorly than usual, as long as the head viewed from above, its anterior margin about one half

the posterior; collum broad, callosities prominent. Scutellum longer than wide, as long as the pronotum. Costal margin of the elytra quite strongly arcuated, their greatest combined width is to the basal as seven to five. Legs very long; hind femur nine times as long as wide, broadest before middle; hind tibiæ nearly one half longer than their femora, their spines scarcely longer than the thickness of the segment; rostrum long attaining middle of venter.

Color whitish, becoming tinged with yellow on pronotum and scutellum; head polished, fulvous, with a large black spot covering the front between the antennæ from middle of vertex to base of clypeus; cheeks bilineate with rufo-fuscous; pronotum with an even black vitta before the white hind edge; elytra whitish tinged with yellow on the costa; margin, nervures and claval suture lineate with blackish; disk with dark marks indicating two transverse bands, tip of corium and of cuneus black; membrane whitish hyaline, its apex and the border of the areoles maculated with fuscous; femora sparsely irrorate with fuscous; the apex of the hind pair infuscated; apex of tibiæ and tarsi blackish. Antennæ pale, darkened by the short appressed hairs; apex of II broadly black; III and IV infuscated, the base of the former pale. Upper surface clothed with appressed white hairs with a few stiff black ones on the dark areas and on the collum.

Described from four females taken by me at Huntington Lake, Fresno Co., Cal., July 16–25, 1919, at an elevation of 7–9,000 feet. This large species is so distinct it can safely be described from females alone.

Holotype, female (No. 709), and paratypes in collection of the California Academy of Sciences.

26. *Phytocoris barbatus*, new species

Similar to *cuneatus* Van D. in color with a mark on the clavus, a transverse band on the corium and the cuneus ochraceous; head, pronotum, antennæ and legs clothed with scattering long erect hairs; antennæ and legs annulate. Length 6 mm.

Male: Head oblique, produced before the eye for a space about equal to the length of the eye; gula nearly horizontal; clypeus prominent; vertex flattened, the front more convex than in *cuneatus*. Antennæ slender; segment I as long as head and pronotum together, moderately thickened toward the base and at immediate apex; II not quite twice the length of I, linear; (III broken, IV wanting in type); rostrum attaining hind coxæ. Pronotum much narrowed anteriorly, more than twice wider on hind margin than on the anterior, its posterior width not quite twice its length; sides straight. Scutellum as long as the pronotum. Hind femora nearly as long as corium and cuneus together, gradually tapering from near base, its greatest width one ninth its length, its tibia nearly one half longer than the femur. Genital segment large, convex; sinistral notch deep, its fundus acutely angled, its dorsal angle produced in a blunt tooth as long as its basal width, this tooth seemingly terminating a projection of the last tergite; sinistral clasper broad, its apex oblique for half its length, its dorsal angle rounded and apex subacute; dextral clasper small, oblique and subacute at apex.

Color pale yellowish ochraceous becoming deeper fulvous on the pronotum, femora and beneath; elytra whitish or lurid with an oblong area on middle of clavus, a broad band across corium and the apex of the clavus and of the cuneus fulvous; membrane white, sparsely irrorate with fulvous at base and apex. Antennæ blackish; segment I varied with pale; II with a broad white annulus at base and another just beyond the middle; III pale at base; I and base of II clothed with a few scattering erect stiff white hairs, the longest as long as the horizontal diameter of the eyes. Legs ochraceous, clothed with short appressed fuscous hairs and very long erect white bristles, even longer and stouter than those on the antennæ; tibiæ with either end and three broad annuli dusky; cheeks and clypeus infuscated, the neck with two fuscous lines behind the eye, visible when the head is exerted.

Described from one male taken by Mr. Fordyce Grinnell at Pasadena, Cal. The hairs in this species are much longer than in *hirtus*.

Holotype (No. 710) in collection of California Academy of Sciences.

27. *Camptobrochys borealis*, new species

Closely allied to *nitens*, differing principally in the form of the male claspers; antennæ darker; scutellum less convex. Length 7 mm.

Head as in *nitens* and *grandis*; smooth and polished above. Antennæ with segments I and II a little stouter than in either allied species; I exceeding the tylus by a little more than half its length, in *nitens* by scarcely more than one third its length; II three fifths the basal width of the pronotum; III a fourth longer than IV, these together about equal to II. Pronotum as in *grandis* but the punctures less coarse and deep, the callosities well elevated, smooth and polished, broader and more conspicuous than in *nitens*. Scutellum as in *grandis*, less convex than in *nitens*; embolium sometimes entirely without punctures, the elytra otherwise as in the allied species. Rostrum attaining the apex of the intermediate coxæ. Hairy vestiture of the antennæ longer than in *grandis*, about as in *nitens*.

Color variable as in the allied species averaging darker than in *nitens* and paler than in *grandis*; fulvotestaceous varied with piceous or brown and coarsely punctate with blackish; pronotum mostly piceous with the margins and broad median line pale, the callosities deep black; vertex pale with a broad longitudinal piceous vitta either side, in pale examples represented by a blackish spot between the eyes; clypeus bivittate with piceous. Scutellum brown with a broad piceous vitta either side, the margins and apex of the median vitta broadly whitish; in *nitens* the scutellum is yellowish with the piceous vittæ more or less strongly indicated; in *grandis* black with the apex and narrow median line and lateral margins at base pale. Elytra clouded, becoming piceous on base of clavus and disk of corium, the embolium pale. Membrane fuliginous with the broad basal margin and a large area at apex of cuneus pale or hyaline, the cuneus hyaline with a fuscous apex. Antennæ fuscous brown, the incisures and apical two segments paler brown. Rostrum and legs pale testaceous, the apex of the rostrum, femora and tarsi darker, the hind femora often piceous on their apical one half. Beneath varied with testaceous and brown, becoming blackish on the venter in the male.

Dextral male clasper slender, thickened at base and obtusely bifid at apex; sinistral broad, a little arcuated above, with its base prominently convex and polished, not produced in a tooth. In *nitens* the base of the sinistral clasper is produced in an acute recurved tooth nearly one third the length of the ventral portion, while in *grandis* this tooth is nearly as long as the ventral member, erect, a little curved and obtuse at tip.

Described from two pairs taken by me at Portland, Me., July 4, 1909, a male from Hamburg, N. Y., taken July 1, 1911, one pair taken at Quinze Lake, P. Q., August 18, 1907, and one male and two females taken at Smith's Cove and Bear River, Nova Scotia, and kindly sent to me for study by Mr. W. H. Brittain, and a series from Ithaca and Batavia, N. Y., received from Mr. H. H. Knight.

This species with *grandis* and *nitens* form a difficult group but distinguishable by the form of the male claspers. The color in *nitens* is paler with the punctures more distinct, the antennæ pale or slightly infuscated at apex and the scutellum more convex and paler and the membrane hyaline. In *borealis* the antennæ are darker with the basal two segments thicker and piceous, the basal longer, the scutellum flatter with a piceous vitta, the margins and median line hardly paler and the membrane largely fuscous. In *grandis* the antennæ and general color is even darker than in *borealis* with the scutellum piceous but narrowly edged and lined with pale and the membrane fuscous at apex.

Holotype, male (No. 711), and allotype, female (No. 712), from Portland, in collection of California Academy of Sciences. Paratypes in collections of author and of H. H. Knight.

28. *Camptobrochys manitou*, new species

Form of *fenestratus*, short, ovate, convex, the cuneus and membrane strongly deflexed; whitish testaceous, polished, a little tinged with yellowish on the head, coarsely fusco-punctate and varied with fuscous; callosities and lateral areas of scutellum black, polished; base of cuneus broadly pale. Length $4\frac{1}{2}$ to 5 mm.

Head as in *nitens*, as wide as anterior margin of pronotum, hardly polished; clypeus less prominent than in *fenestratus* and its allies. Pronotum broader anteriorly than in *fenestratus*, the anterior margin a little more than one half the basal width and slightly greater than the median length; sides straight, slenderly carinate but not at all explanate, hind edge ob-

viously emarginate; surface strongly convex, polished; coarsely, sometimes confluent, punctate. Scutellum convex and polished as in the allied species, impunctate; medially obscurely transversely wrinkled. Elytra as in *fenestratus*, broad, convex, including the embolium coarsely fusco-punctate; base of cuneus sometimes punctate. Membrane obscurely bi-areolate. Rostrum reaching the intermediate coxæ; first segment attaining base of head. Sinistral clasper of male with a long acute porrect basal tooth as in *grandis*, the ventral member in the type concealed but apparently very acute at apex and passing beyond the dextral clasper which is of the usual form, ovate at base and produced in an acute point.

Color testaceous white, coarsely fusco-punctate and maculate; head tinged with yellow, infuscated; vertex and front with four or five transverse arcs and margined with the same color, deepened to piceous above the antennæ; clypeus pale, bilineate with piceous, the sutures of the cheeks also piceous. Antennæ with long scattering pale hairs; segment I obscurely lineate, as long as the greatest length of the eyes; II as long as pronotum, slightly clavate and infuscated on apical third; III and IV infuscated, III longer than I, IV shorter. Pronotum slenderly edged with pale, the fuscous punctures usually forming a cloud either side of the disk; anterior margin forming a broad testaceous collum; callosities contiguous, black, polished, bordered anteriorly by a pale sinuate vitta. Scutellum whitish with a dark spot either side, basally contiguous. Elytra with a large piceous cloud at apex produced basally to cover the disk of the corium and apex of the clavus; cuneus pale, piceous at apex; membrane enfumed, with a pale band across at apex of areoles, the veins piceous at base and apex. Legs pale, the femora mostly piceous. Beneath more reddish, invaded at times with piceous; anterior coxal cavities and osteolar region white.

Described from one male and ten female specimens taken by me in the Garden of the Gods at Manitou, Colo., July 19, 1900, and July 25, 1903, and five specimens from Colorado, received from Mr. H. H. Knight. This is the species I formerly determined as *Camptobrochis cerachates* Uhler but a study of the type in the museum of the California Academy of Sciences shows the latter to be a paler form common in California more allied to *fulvescens*.

Holotype, male (No. 713), and allotype, female (No. 714), in collection of California Academy of Sciences. Paratypes in collections of the author and of H. H. Knight.